(Hemi-Sync® Journal, Vol. XVI, No. 3, Summer 1998)

OPENING THE DOOR WITH METAMUSIC®

by Suzanne Evans Morris, Ph.D.

Suzanne Evans Morris, PhD, a speech-language pathologist based near Charlottesville, Virginia, is nationally and internationally known for her work with children with developmental disabilities. Dr. Morris maintains a private practice including direct clinical work, continuing education programs, development of clinical materials, and clinical research. She is the director of New Visions, which sponsors innovative professional workshops and provides family-centered clinical services. She is also a member of The Monroe Institute Board of Advisors, a Gateway Outreach Trainer, and has been a Professional Member since 1983. This article is excerpted from Dr. Morris's presentation at the First International Conference on Music in Human Adaptation held November 15-17, 1997, in Roanoke, Virginia. A copy of the complete paper with all references is available on request.

The Challenge

Children with oral feeding disorders create a subgroup of infants and young children with developmental disabilities due to cerebral palsy and other sensory motor disorders (Morris 1985b). Many of these youngsters present a complex picture of poor coordination of sucking, swallowing, and breathing. Others experience severe defensive reactions to the sensory input of food, with major difficulties transitioning from breast or formula feedings to solid foods. Negative experiences related to gastrointestinal discomfort, force feedings, and silent aspiration may further complicate the picture, resulting in feeding resistance. Many children are nutritionally supported by feeding tubes as they make the slow transition to oral feedings. Others move slowly through the developmental progressions of feeding.

As a group, these children provide a major challenge to parents and therapists. We live in a culture that highly values the ability to eat. A mother's feelings of nurturing and parental adequacy are connected to her child's eating. Family stress increases when the child is unable to eat orally or has major feeding difficulties. Parents feel pressure when they need to get a calorically and nutritionally adequate diet into a child who eats slowly or is a picky eater because of sensory processing problems. This increases the anxiety level of both parents and children.

Therapy addresses the underlying problems with postural tone and movement of the body that influence coordination of the oral-motor and respiratory systems. Issues with oral defensiveness are viewed as part of a larger problem of sensory processing and integration. Approaches to reduce anxiety and increase self-confidence and trust enable both parent and child to learn the skills needed to become a competent and efficient feeder. Although specific

strategies or techniques are introduced to facilitate this process, the underlying journey is one of empowering the child as a learner and self-healer.

Metamusic

In the early 1980s Robert Monroe began to incorporate many of the Hemi-Sync® sound patterns developed for the guided tapes into a music background, which he called *METAMUSIC*®. *METAMUSIC* tapes opened the door for children to benefit from Hemi-Sync sound patterns, since the verbal content of the original tapes was inappropriate. It allowed listeners of all ages to enjoy Hemi-Sync as an open, nondirected background for activities such as reading, studying, sleep, and self-generated imagery.

Three distinctive Hemi-Sync sound patterns may be blended with the music component of *METAMUSIC*. Since there is a correlation between the predominant frequency of brain-wave patterns and states of conscious awareness, different subjective states will be observed as listeners are introduced to different binaural beat combinations.

Relaxed-focus tapes are based on Hemi-Sync sound patterns that facilitate lower frequency brain wave patterns in a predominantly theta (4-7 Hz) range. This hypnagogic state has been associated with greater openness for learning (Budzynski 1981). Most listeners experience the unique combination of increased physical relaxation with a high level of mental alertness, and a wide or open focus of attention.

Concentration tapes incorporate higher frequency Hemi-Sync patterns in the alpha (8-12 Hz) and beta (13-26 Hz) ranges. Subjective reports include high-level alertness combined with the increased narrow focus of attention used in task-oriented activities.

Sleep tapes create the pattern of binaural beats that gradually move the listener into the very slow delta state (1-3 Hz) associated with deep sleep.

METAMUSIC **and the Child with Developmental Disabilities**

Formal Observation

Between 1981 and 1985 I completed a pilot study of twenty developmentally disabled children. The children in this group were enrolled in a therapy program to remediate their oral feeding problems. An initial baseline period of four to six sessions observed the child's response to therapy without music. This was followed by a second period of two to four therapy sessions with a music background which did not contain Hemi-Sync sounds. These two segments of the program created a clinical observation profile for each child in a non-Hemi-Sync environment. A third period of observation introduced Hemi-Sync signals in the theta range (i.e. relaxed-focus tapes) into the same music that was used in the second phase of the study. Informal

written and videotaped data were recorded to document the child's progress in therapy under each condition. Many children received therapy with a *METAMUSIC* background for one to two years.

Two of the children (10%) responded negatively to the music containing Hemi-Sync, and its use was discontinued. Three children (15%) showed minimal or inconsistent changes in the Hemi-Sync *METAMUSIC* environment. Fifteen (75% of the total) of the remaining eighteen children who continued to receive the music containing Hemi-Sync showed positive changes in the behaviors being worked on in treatment. Changes that were observed included improved focus of attention, reduction in tactile defensiveness and overall improvement in sensory organization, increased physical relaxation, improved motor coordination, and reduction in fearfulness. All of the children exhibited a greater openness and enthusiasm for learning. Changes were not evident until Hemi-Sync was introduced. In several instances behavioral changes were noted with the calming music background; however, the degree of change and permanence of change were more pronounced when Hemi-Sync was combined with the music.

Varney (1988) completed a study of six boys between the ages of fifteen and twenty-nine months who were enrolled in a home-based early intervention program. Diagnoses included Down syndrome, neurological disorder, and developmental delay. Varney used a modified single-subject design to compare the responses of three children who listened to *METAMUSIC* with Hemi-Sync (relaxed-focus tapes) during weekly one-hour intervention sessions for a period of four to five weeks to the responses of three matched children who listened to the same music without the Hemi-Sync signals. Five of the six children in the study demonstrated improvements during intervention. The three children who listened to *METAMUSIC* with Hemi-Sync during intervention demonstrated greater improvement than the children who listened to the same music without Hemi-Sync. She concluded that playing *METAMUSIC* with Hemi-Sync during intervention appeared to improve the imitation of gestures, facial expressions, two-word phrases, and spontaneous use of two-word phrases. Significant increases in attending behaviors and child-initiated interactions also were observed.

During intervention with *METAMUSIC* with Hemi-Sync, changes in behavior occurred more quickly than would be expected. All three of the children who listened to the *METAMUSIC* with Hemi-Sync demonstrated steeper slopes of change during intervention. For example, one child increased recorded behaviors from 0% to 100% between the first and second intervention sessions. The other two children made increases of 42-45% between two or more intervention sessions. These changes also occurred earlier in the intervention program than did the changes observed in the three children listening to the music alone. Seizures did not increase for the child with a neurological disorder and history of a seizure disorder during the period in which the Hemi-Sync signals were included in the intervention. This is also in agreement with the findings of Morris (1985a,b). Varney concludes that the study "...offer[s] evidence

supporting the use of *METAMUSIC* with Hemi-Sync as an effective adjunct to a communication program which is appropriate to the needs of young children with developmental disabilities…. Although the usefulness and effectiveness of *METAMUSIC* with Hemi-Sync requires additional empirical evidence, interventionists may find that playing *METAMUSIC* with Hemi-Sync during intervention with young children with developmental disabilities will improve attention behaviors, social interactions and communication."

Guilfoyle and Carbone (1997) reported the results of a preliminary study of twenty developmentally disabled adults with mental retardation. Subjects were matched on the basis of IQ and were divided into experimental and control groups. Each group listened to music on stereo speakers while watching nature videos without sound tracks. Hemi-Sync signals in the alpha-beta range for focused attention/concentration were present in the music presented to the experimental group. The control group listened to the identical music without Hemi-Sync. Subjects were tested (pre-test and post-test) for short- term auditory memory and sustained focus of attention before and after the video and music. In addition to the formal testing, each subject was rated on six scaled measurements of attentiveness and associated behaviors. Each subject attended fifteen thirty-minute training sessions. Differences between the pre-test and post-test scores were compared for the experimental and control groups.

The group listening to the music containing Hemi-Sync signals (i.e., *METAMUSIC*) showed statistically higher scores on the digit symbol test, and significantly higher ratings on resistance to distraction, attention to speech, level of alertness, and level of irritability. The control group, listening to music only, did not show similar changes.

Case Study: A Child with Autism

A two-year-old boy with autism showed severe disorganization of his response to sensory input and sensory overload. He had limited eye contact, and engaged in stereotypic behaviors such as rocking and flapping his hands. He was fussy and irritable, or withdrawn into his internal world. He disliked touch to his upper body, hands, face, and mouth. When he reached a state of sensory overload, he released the stress through gagging and vomiting. Although he liked children's music tapes and quiet classical music, these types of music had no effect on his sensory behaviors. In some instances they appeared to increase his difficulty with his environment. He drank formula from a bottle and seemed more organized with the rhythmical sucking pattern that it required. He ate three small meals of pureed food per day: however, the random sensory input from the spoon, food tastes, and texture created maximum stress. He pushed back in the chair, clamped his mouth closed, pushed his mother's hand and the spoon away, and cried. He was able to cope with the situation by focusing his attention hypnotically on a child's music videotape to cut out interaction and other sensory input.

After an initial thirty-minute session with a relaxed-focus *METAMUSIC* tape, he accepted touch to his hands and chest, initiated eye contact and smiling, and appeared to be calm and peaceful. *METAMUSIC* tapes were incorporated into a sensory-based treatment program for the next week. He was seen for five hours of intervention per day, with *METAMUSIC* used approximately 50% of the time. He continued to show increased interaction and eye contact, began to explore toys, imitated his body movements and facial expression in a mirror, and was able to regulate his response to sensory input more efficiently. Gagging and vomiting ceased. During mealtimes he was more open to changes in his physical position in the chair and presentation of the food. Although he still needed his videotape at mealtimes, he was more interactive with his mother and began to come forward to initiate a bite from the spoon when a *METAMUSIC* tape was played thirty minutes prior to the meal. He no longer cried and pushed the food away.

During the next six months of home-programming, his parents felt that he was less alert and tended to become sleepy when a relaxed-focus *METAMUSIC* tape was played. When a concentration *METAMUSIC* tape was substituted, he was more focused, and no longer became sleepy. Within ten months, he was taking a wide variety of foods, and had progressed to chewing mashed and chopped textured foods.

Case Study: A Child with Cerebral Palsy

A three-year-old boy with cerebral palsy received most of his meals through a gastrostomy feeding tube because of severe disorganization of swallowing and breathing. He had recently shown an interest in eating, and his parents gave him small oral feedings each day. During these meals, his breathing was noisy and labored, and he showed frequent choking and coughing. He had great difficulty moving his body volitionally because of high muscle tone and strong tonic reflex movement patterns. He frequently arched into hyperextension of his body and head. He drooled profusely. The base of his tongue was pulled back into a slightly retracted pattern, intermittently occluding the airway. This pattern contributed to his difficulty with breathing coordination during eating and drinking. Although it was possible to use gentle manual traction under the chin to draw the base of the tongue forward, he consistently resisted this treatment strategy. His sleeping patterns were stressed. As he fell asleep, his body went into strong spasms that were accompanied by tongue retraction and severe obstruction of the airway. These episodes of obstructive sleep apnea were terrifying because of their sudden onset and his inability to breathe. His panic and increased tension resulted in stronger reflexive retraction of the tongue and long periods of apnea. He resisted going to sleep, and it often took three to four hours for him to calm down and sleep. When a sleep medication (such as chloral hydrate) was given, he was groggy and unalert the following morning. His parents preferred to help him learn to go to sleep while they were up. They gave lesser amounts of the medication in the late evening when they went to bed. Without this medication, the sleep-wake-apnea episodes continued throughout the night, and the whole family experienced sleep deprivation.

A relaxed-focus *METAMUSIC* tape was used initially during quiet, on-the-lap activities such as listening to a story. This enabled the therapist to feel any changes in muscle tone and movement coordination that were related to Hemi-Sync. During these sessions, his postural tone reduced, and he could interact with a storybook as his hand was guided to different pictures. He accepted the therapist's hand under his chin to facilitate a more forward position of the tongue. He was interested in the contrast between his noisy and quiet breathing patterns, and began to maintain the quiet pattern independently for longer periods.

Oral feeding sessions were held with the child supported on his mother's lap. Physical assistance was given to keep the tongue out of the pharyngeal airway. Sucking and swallowing movements became more regular and rhythmical, and were well coordinated with breathing. There was no coughing or choking. A modified barium swallow study several months later showed an efficient swallow with no aspiration. A relaxed-focus *METAMUSIC* tape was used at each meal, and intermittently throughout the day. The child learned to use a more forward head position and keep the base of the tongue out of the airway. At the end of the five-day intensive treatment program, he used a quiet breathing pattern more than 75% of the time, and was spontaneously swallowing his saliva. Drooling was minimal.

Evening therapy sessions were held at bedtime. A *METAMUSIC* sleep tape was introduced to help him relax and fall asleep with less physical and emotional stress. The therapist used the positive suggestions that he could sleep peacefully and breathe quietly. Intervention to inhibit his tonic reflex patterns and keep the tongue in a more forward position was used at the first sign of the spasm. Over a four-day period he was able to fall asleep within a thirty-minute period. He had one or two small spasms during the initial sleep period, but was free from apnea episodes. An adult remained with him for physical and emotional support during this period, repeating the positive suggestions for easy sleep, and helping him maintain a forward tongue position. Three weeks after the program began, his parents weaned him from the sleep medication, and he slept through the night.

Summary

METAMUSIC tapes containing the binaural beat patterns of Hemi-Sync open the door to learning for many children with developmental disabilities. Children with oral feeding difficulties have increased their skills and comfort level more efficiently when *METAMUSIC* was included in the learning environment. The sound technology is inexpensive, nonnvasive, and effective. *METAMUSIC* makes an important contribution to most rehabilitation programs.

References

Budzynski, T. 1981. Brain lateralization and rescripting. Somatics, Spring, 3-9.

Bullard, B. 1997. Personal communication.

Bullard, B. 1995. The Road to Remembrance. Hemi-Sync Journal, 13 (1).

Guilfoyle, G. and D. Carbone. 1997. The facilitation of attention utilizing therapeutic sounds. Hemi-Sync Journal, 15 (2).

Morris, S. E. 1991. The facilitation of learning. Chap. 9 in Neurodevelopmental strategies for managing communication disorders in children with severe motor dysfunction, edited by M. Beth Langley and Linda J. Lombardino. Austin, Tex. ProEd, 251-96.

Morris, S. E. 1990. Hemi-Sync and the facilitation of sensory integration. Hemi-Sync Journal, 8 (4).

Morris, S. E. 1985a. Music and Hemi-Sync in the treatment of children with developmental disabilities. Breakthrough, December.

Morris, S. E. 1985b. Developmental implications for the management of feeding problems in neurologically impaired infants. Seminars in Speech and Language, 6 (4): 293-315.

Sornson, R. 1996. Personal communication.

Varney, K. 1988. Metamusic with Hemi-Sync as an adjunct to intervention with developmentally delayed young children. Master's thesis, Virginia Commonwealth University.

Hemi-Sync® is a registered trademark of Interstate Industries, Inc.
© 1998 The Monroe Institute